in the first quarter of 2012 and it dropped to 4.02‰ in 2013. CRKP percentage in Klebsiella pneumoniae isolates for nosocomial infection was 28% in 2012 and it dropped to 9.1% in 2013. Since May of 2014, active surveillance was restricted to the transferred case from other hospital or respiratory care wards and who received prolonged antibiotic during hospitalization.
Conclusions: Patients who were transferred from other hospital or respiratory care ward should be considered as high risks of CRE carriers as well as those with prolonged antibiotic medication during hospitalization. Active surveillance of CRE can early identify of possible carriers and helps for prevention of CRE outbreak in the hospital.

PS 1-199

INVESTIGATION REPORT ON AN EVENT OF NEUROSURGICAL POSTOPERATIVE SURGICAL SITE INFECTIONS

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Purpose: During July to August 2012, the infection rate of the Neurosurgery Department of a medical center was significantly increased to 0.6‰ compared with 0.3‰ last year via the routine medical care associated infection surveillance. Further analysis showed that the operation room, apparatus and operators were partially overlapped. The leading pathogen was *Staphylococcus aureus* (6 cases) with similar susceptibility profile. The investigation was processed under the suspicion of the same pathogen related neurosurgery site infection.
Methods: There were twelve cases included into this investigation, the average age was 64, and average hospitalization duration from operation to date was 42 days. Two patients (17%) had diabetes mellitus with normal blood sugar before operation. Nine patients (75%) had received operation during last admission. All patients had received adequate prophylactic antibiotics before operation. Half patients' pre-operation anesthesia level was three. The rate of clean wound, implant use and deep tissue infection were 66.7%, 58.3% and 75%, respectively.
Results: For investigating the possible infection route and source, the infection surveillance staff had visited the operation room and measured the bacteria of the operation room's air, disinfection soap grooves and the operators' hands. The only two positive finding were the exposure time of aseptic apparatus was more than one hour, and the unnecessary operator entry. The 4-hour bacteria amount was 50 CFU during operation, higher than 5 CFU during empty time. The results suggested that control the unnecessary operator entry could decrease the amount of bacteria in the operation room.
Conclusions: We performed three investigation ways included 1. Control the unnecessary operator entry 2. Shorten the aseptic apparatus exposure time 3. Emphasize the aseptic technique of brush hand and the adequate aseptic covering area. The neurosurgery infection rate were significantly decreased to 0.2‰ p values <0.05 statistically significant and continually within 0.5‰ August 2014. This investigation was successfully control the neurosurgery related infection and enhanced patients' safety.

PS 1-200

HOSPITAL-WIDE SURVEILLANCE OF CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS; INPATIENT WARDS VS. INTENSIVE CARE UNITS

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Purpose: Central line-associated bloodstream infections (CLABSIs) are among the most common and serious outcome experienced by inpatients. There were many studies on CLABSIs of intensive care units (ICUs), but the studies of inpatient wards were rarely reported in Korea. The aim of this study was to determine the incidence of CLABSIs for all hospitalization patients and to compare their CLABSI events.
Methods: We prospectively conducted surveillance for all inpatients who had Central venous catheters (CVCs) in 32 wards and 4 ICUs of a teaching hospital with 850 beds, from January to December in 2013. CLABSI incidence rates(cases/1,000 catheter-days) were surveyed using CDC/NHSN surveillance definition including CLABSI events. Event data on age, gender, type of catheter, duration of catheter utilization, department, type of ward were obtained.
Results: Overall, the CLABSI rates of all inpatients were 1.61(cases/1,000 catheter-days) and central catheter utilization ratio was 0.07(catheter days/patients days). A major causative CVC of CLABSIs was non-tunneled line(53%), and peripherally inserted central catheter was followed(37%). The CLABSI rates were 1.59(cases/1,000 catheter-days) in inpatient wards and 1.62(cases/1,000 catheter-days) in ICU. There was no difference on CLABSI event inpatient wards vs. ICU.
Conclusions: In KOREA, recently study was aimed to reduce CLABSI for ICU but this study showed that CLABSI for inpatient wards were similar incidence with ICU. We suggest that it is necessary the further study to analyze for risk factors of CLABSI in inpatients ward and also to conduct the hospital-wide strategies implementations for prevention of CLABSIs.

PS 1-201

APPLYING ACTIVE SURVEILLANCE ON EARLY ENVIRONMENTAL DETECTION TO DETERMINE THE RISK FACTORS OF METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* COLONIZATION

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Purpose: Methicillin resistant *Staphylococcus aureus* (MRSA) is one of major pathogens causing hospital acquired infection. The MRSA dissemination may be reduced by active surveance to patients at admission, implement of contact precautions, and strengthening of environmental cleaning process. The purpose of our study was to determine the risk factors of MRSA colonization by using active surveillance on early environmental detection.
Methods: An observational study was performed in a medical center hospital in Taiwan. Participants admitted to infection wards were recruited. Active surveillance was conducted within the first 24-hour following their admission and every three days by taking their bed rails culture samplings until participants were transferred, discharged, or expired.
Results: During study period, 182 patients and takes 736 times. Positive environmental cultures were found on 7% of admitted patients at the first sampling, and then 19% of samples turned to positive during the following samplings. The mean of transforming negative to positive environmental cultures was 11 ± 10 days. Patients admitted with a nasogastric tube was a significant factor ($p = .005$) for positive environmental MRSA colonization. Logistic regression, after adjusting other factors, showed that patients with bedsore resulted in 2.7 times of MRSA colonization (95% Confidence Interval〔CI〕1.04-7.07, $p = .048$), 2.8 times with steroid therapy (95% CI 1.21-6.63, $p = .020$), and 1.1 times with an extra day of hospitalization (95%CI 1.03-1.08, $p = .015$).
Conclusions: Active surveillance could early detect MRSA colonization. The high risk groups include patients with bedsore, steroid therapy, and long-term hospitalization. Increasing the admission assessment of high risk patents can reduce MRSA colonization. Early implementation of straightening environmental cleaning to patient admitted with high risk could prevent the dissemination of MRSA.

PS 1-202

EXPERIENCE SHARING IN REDUCTION OF CLABSI IN SICU OF REGIONAL HOSPITAL BY USING BUNDLE CARE

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Purpose: Central venous catheter (CVC) is one of the common used equipments in intensive care unit. According to Taiwan Nosocomial Infection Surveillance system (TNIS), the density of central venous Catheter-related blood stream infection is 2‰. CLABSI is a potential risk caused morbidity

and mortality and it prolongs hospitalization days to 5～20 days. It is very important to implement CVC bundle care to reduce CLABSI.
Methods: We joined CVC Bundle Care Project of Centers for Disease Control from 2013 to 2014. We established CVC bundle checklist by evidence-based database. The five methods are : 1. hand hygiene, 2. maximal sterile barrier, 3.use of 2% Chlorhexidine, 4. use of Tegaderm patch, 5. daily evaluation and record by camera and computer. We also implement the competition for symbols and mascot, objective structured clinical examination (OSCE) in doctors, CVC bundle education, technical observation in medical centers, computerized our checklist, post our symbols.
Results: By implementing these methods for 1 year and 10 months, our rate of CLABSI decreased from 4.56‰ to 1.68‰. The utility rate of CVC decreased 56.7% to 51.2%. There are 13 months free of CLABSI from Jan. 2013 to Sep 2014.
Conclusion: The difficulties are: 1.the co gnition and behavior change, especialy in adding assistants and needed to wear cap, isolation dress, and the use of maximal sterile barrier. 2.daily evaluation. We hold many activities and education to make CVC bundle care as internalization, and use digital camera to store the pictures of daily care. After our efforts, the rate of CLABSI and the medical costs both decreased. The safety of our patients got promoted and approached our goal of "Zero Tolerance" in CLABSI.

PS 1-203

MULTI-PRONG PROGRAM IN REDUCTION OF HEALTHCARE-ASSOCIATED METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* BACTERAEMIA IN SGH

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Purpose: To evaluate the effectiveness of a multi-prong program to reduce MRSA bacteraemia in an Active Tertiary Hospital.
Methods: A multi-prong program was introduced in the hospital which included an enhanced hand hygiene program, pre-operative baths, isolation precautions instituted for all tagged cases, improved environmental hygiene, electronic tagging and un-tagging system, and active MRSA surveillance for all patients upon admission. The rate of healthcare-associated MRSA bacteraemia was then used as an indicator as a monthly feedback on the program to all stakeholders.
Results: The overall hospital-wide rate of MRSA bactaeremia rate from Y2008 to Y2014 decreased from 3.5 per 10 000 patient-days before intervention to 1.2 per 10,000 patient −days after intervention. This is statistically significant using the paired t-test ($p<0.001$).
Conclusions: We have demonstrated the effectiveness of a multi-prong program to reduce the transmission of healthcare−associated MRSA bacteraemia in our setting. Further studies are needed to determine whether the program is sustainable over a longer period of time.

PS 1-204

THE REDUCTION OF CATHETER-RELATED BLOODSTREAM INFECTIONS IN MICU BY BUNDLE CARE

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Purpose: Most ICU patients to be placed due to treatment-related invasive ductal. Hospital ICU medical care related infection rate was 4.2 times the general ward (2010-2013 average), MICU bloodstream infection rate was 3.1 times the general ward (2010-2013 average). Bloodstream infections always lead to severe infections, high mortality and prolonged hospital stay. High Court bloodstream infections again MICU unit occupies first place, so the devaluation of its main implementing units.
Methods: In June 2012,we are implementing a CVC care bundle that includes hand hygiene, maximal barrier during insertion, chlorhexidine skin antisepsis, optimal catheter site selection that avoids the femoral site, a bundle checklist during catheterization, daily line care, and removal of the line when it is no longer needed.
Results: Since January 2012 to June, bloodstream infections rate of MICU was 7.95 ‰.After a series of interventions, June to December of bloodstream infections rate was 1.23 ‰. Statistics by the Fisher Exact Test statistically significant $p<0.005$.
Conclusions: The CRBSIs could be further prevented by CVC bundle intervention. Continuous monitoring can shorten the implantation duration of CVC thus decrease the rate of CRBSIs.

PS 1-205

MOLECULAR EPIDEMIOLOGY OF THIRD GENERATION CEPHALOSPORIN-RESISTANT *ESCHERICHIA COLI* OF PATIENTS WHO STAYED IN RESPIRATORY CARE WARDS IN MIDDLE TAIWAN

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Purpose: Escherichia coli is the most common pathogen in respiratory care ward (RCW) patients. This study was conducted to investigate the genotyping and prevalence of antimicrobial resistance genes in third generation cephalosporin-resistant (TGCR) blood E. coli isolates obtained from RCW patients.
Methods: TGCR blood E. coli isolates obtained from RCW patients of three regional hospitals were collected during 2012. Genes of plasmid-mediated extended-spectrum and AmpC beta-lactamases, and quinolone resistance (qnr, qepA, and aac(6')-Ib) were detected by PCR method and sequencing. Pulsed-field gel electrophoresis (PFGE) and multilocus sequence typing (MLST) were applied for genotyping.
Results: A total of 58 TGCR blood E. coli isolates were collected. Nineteen isolates, 14 isolates, and 25 isolates were obtained from A, B, and C hospital, respectively. PFGE patterns analysis revealed 52 pulsotypes and were grouped into 35 clusters or unique strains. Only cluster T and AE had more than 5 isolates. MLST analysis revealed 16 sequence types and predominant types were ST131 ($n = 20$) and ST68 ($n = 17$). blaCTX-M-3, blaCTX-M-14, blaCTX-M-15, blaCMY-2, and aac(6')-Ib were detected in 3, 29, 3, 37, and 13 isolates, respectively. Between isolates of ST131 and ST68, there were no significant difference in distribution among three hospitals, carriage of antimicrobial resistance genes except ST68 isolates had a higher prevalence of both blaCTX-M-14 and blaCMY-2 ($p < 0.05$).
Conclusions: Not only ST131 but also ST68 of TGCR E. coli were spreading in RCW patients in middle Taiwan. blaCTX-M-14 and blaCMY-2 were the most common 2 encoding genes of third generation cephalosporin resistance in E. coli.

PS 1-207

BACTEREMIA CAUSED BY CONTAMINATED INTRAVENOUS DRIP DRUG

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Purpose: Serratia marcescens is a species of rod-shaped Gram-negative bacteria, which is abundant in presence in the environment and involved in hospital-acquired infections (HAIs), particularly catheter-associated bacteremia, urinary tract infections and wound infections and is responsible for 1.4% of HAI cases in the United States.
Infection control practitioner detected two nosocomial bloodstream infection cases in a Neurosurgical Ward. Both patients developed symptoms of fever, chills and tachycardia when injected with Mannitol.
Methods: Site investigations found an inappropriate heating process instantly. Meanwhile the blood specimen and the intravenous drug within the infusion control set developed the same bacteria strain- *Serratia marcescens*. This means health care workers pollute the drug during the preparing or injection process. Mannitol is an osmotic diuretic,which is used clinically in osmotherapy to reduce acutely raised intracranial pressure therefore this drug has very high usage in the Neurosurgical Ward. When room temperature is below 25 degree Celsius,crystal formed and crystal also formed within the infusion control set.In order to melt the crystal, health care workers heated both the Mannitol bottle and the infusion control set by water bath, they tied Mannitol bottle and the infusion control set together. So water in the Water Bath penetrate into the infusion control set.
Results: After shifting the heating method from water bath to Double Boiler, this kind of event never happen again.